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ABSTRACT

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A structure and method for electronically minimizing or eliminating performance variation of an apparatus controllable by a control signal, such as an electronically-controlled fuel injector, is disclosed. The method includes the steps of measuring the resultant characteristics of the apparatus at a plurality of operating conditions, such as timing and delivery characteristics of the fuel injector, adjusting the control signal as a function of the measured resultant characteristics, such as by adjusting a base timing and duration or pulse width of a fuel delivery command signal for a fuel injector, and controlling the apparatus in accordance with the adjusted control signal to reduce performance variation. A structure is disclosed to compensate or trim for individual injector variation, includes an electronic control module having a memory for storing trim signals for each injector, the trim signals being derived from observed performance parameter values taken at a plurality of operating conditions, a plurality of sensors for detecting at least one, and preferably a plurality of operating parameters and generating a respective one, and preferably a plurality of, operating parameter signals, and a means for communicating the trim signals to the memory. The electronic control module adjusts a base fuel delivery signal for each injector as a function of the trim data signals for each injector.

(31 Claims, 7 Drawing Sheets)

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